



Programme

Moderation: Bart Verberck

Regional Executive Editor at Springer Nature

Welcome

Tatjana König, Managing Director Falling Walls Foundation

Moderated Conversation

- Klaus Ensslin, Professor of Solid State Physics, ETH Zurich
- Tommaso Calarco, Professor at the Institute for Complex Quantum Systems, University of Ulm

ETH Ideas Lab: Demystifying Quantum

- Vanessa Wood, Professor, Head of the Laboratory for Nanoelectronics, ETH Zurich
- Jonathan Home, Professor of Quantum Optics and Photonics, ETH Zurich
- Sebastian Huber, Professor, Institute for Theoretical Physics, ETH Zurich

ETH Zurich Start-Up Pitches

- Andreas Hugli, IRsweep, Co-founder
- Sadik Hafizovic, Zurich Instruments AG, Co-founder and CEO

Q&A

Networking Reception

Demystifying Quantum

Friday, 3 November 2017

17.30 h

Musikbrauerei

Greifswalder Str. 23A, 10405 Berlin



Modern computers are powerful machines, but they operate based on the laws of classical physics. But why restrict ourselves to classical laws? The world of quantum physics which is accessed in many experiments today offers a completely different set of laws and opportunities. This includes computing problems which cannot be performed on any classical supercomputers, such as structural calculations for materials and molecules. In physics, this could be applied to the design of advanced superconductors, while in chemistry it provides a new path to the development of industrial catalysts.

ETH Zurich features a diverse network of researchers in quantum technologies. On the hardware side this includes the realization of so-called quantum bits by ions, atoms, photons, superconductors or simply electron spins in semiconductors. These fundamental studies are connected to practical applications such as batteries or sound engineering. At this symposium, researchers from ETH Zurich will report about their research and connect it to the larger context of a "Quantum Technologies Flagship" which will be started by the EU next year.



Klaus Ensslin studied Physics in Munich and in Zurich and obtained his PhD 1989 at the Max-Planck-Institute in Stuttgart. After postdocs in Santa Barbara and Munich he started a professor position at ETH Zurich in 1995. Since 2011 Klaus Ensslin is the director of the Swiss National Center for "Quantum Science and Technology". Klaus Ensslin's research focuses on quantum devices materials with the goal to engineer novel quantum states with enhanced coherence and manipulation properties.



Tommaso Calarco (Institute for Quantum Complex System, University of Ulm) has pioneered the application of quantum optimal control methods to quantum computation and to many-body quantum systems. He is the director of the centre IQST, which involves the University of Ulm, Stuttgart and the Max-Planck-Institute for Solid State Research. He is one of the authors of the "Quantum Manifesto" and scientific member of the "High Level Steering Committee for the Quantum Technologies Flagship".



Vanessa Wood holds a BSc in Applied Physics (2005), Yale University, a MSc in Electrical Engineering and Computer Science, MIT (2007), and a PhD in Electrical Engineering, MIT (2009). From 2010-2011 she was a postdoc at the Department of Materials Science and Engineering at MIT. In 2011 she was appointed as Assistant Professor at the Department of Information Technology and Electrical Engineering at ETH Zurich. She received tenure in 2014 and chairs the Materials and Device Engineering group.



Jonathan Home is a Professor at ETH Zurich. He leads a research group which is trying to build a quantum computer, while taking advantage of continual experimental advances to investigate the control of quantum physics. His work includes pioneering approaches to generating quantum states, as well as combined demonstrations of the building blocks for a large-scale quantum computer. Jonathan Home has been awarded the ETH Latsis prize, the SAOT Young Researcher award, and is a TED Fellow.



Sebastian Huber earned his PhD in Physics under the supervision of Gianni Blatter at ETH in 2008. Supported by a fellowship by the Swiss Friends of the Weizmann Institute he moved to Israel for his postdoctoral studies. Since 2012 he is an Assistant Professor at ETH Zurich supported by an SNSF professorship. In his research he applies quantum concepts to the engineering of mechanical structures. Moreover, he pioneered the use of artificial intelligence in the study of quantum many-body problems.



Prior to co-founding the ETH Zurich start-up IRsweep, **Andreas Hugi** received his PhD on single-mode and comb operation of broadband QCLs in 2013 at ETH Zurich. He received his Master of Science in Micro- and Nanotechnology in 2007 from the University of Neuchâtel. Among others, Andreas was awarded the ETH Medal for an outstanding doctoral thesis and the Omega student award for his Master's thesis.



Sadik Hafizovic is co-founder and CEO of Zurich Instruments AG. Before incorporating Zurich Instruments AG in 2008 he received his education in microsystem technology at the University of Freiburg, Germany and the Ritsumeikan University, Japan. In 2002 he joined ETH Zurich, Switzerland, where he received his PhD in electrical engineering in 2006. Before incorporating Zurich Instruments, Mr Hafizovic ran a business in Germany providing software and network services.